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THE FRAMEWORK FOR WATER MANAGEMENT PLANNING

A DISCUSSION DRAFT

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Message From the Minister

I am pleased to introduce a draft of the Framework for Water Management Planning for discussion with Albertans. Effective water management paves the way for reliable water quantity and quality that is essential for a sustainable environment and the economic well being of Albertans. The many uses of water affect each other. These interrelationships must be recognized in planning. It is a task for all of us to ensure a suitable water management system is in place for the protection and benefit of all Albertans.

The draft framework outlines the direction for water management planning throughout the province. It is intended to provide consistent direction, while at the same time be flexible enough to consider regional or local situations.

I invite comments and advice from all Albertans who have an interest in the development of this critical water management tool.

Your input is important. Together, we can create a Framework for Water Management Planning that will support sustainable resource and environmental management, recognize both short and long term needs and values for water, and consider local and regional perspectives.

Gary Mar
Minister
Alberta Environment

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1.0 SETTING THE STAGE

Section 1 of this document sets the stage for the development of the Framework for Water Management Planning. It contains information gathered from Albertans during previous review processes and has been adopted by government. It is intended to provide you with background information only.

1.1 Background

Over the last few years, the province has reviewed its water management policies and legislation in a process that involved extensive public consultation. The goal was to establish a new blueprint for the conservation and sustainable management of water. A vision and principles for sustainable water management were developed. New policies to guide water management were accepted by government. A comprehensive new statute, the *Water Act*, is now in effect, providing legislative authority for their implementation.

Throughout the review process, there was strong public support for the need to plan for the future. The government agreed that effective and efficient water management planning is essential and made a commitment to develop a document that would facilitate such planning, *The Framework for Water Management Planning*.

The government also agreed with comments from the public that sustainable water management depends on a healthy aquatic environment. Therefore the *Framework for Water Management Planning* includes a 'Strategy for the Protection of the Aquatic Environment'.

1.2 Sustainable Resource and Environmental Management

The Government of Alberta has affirmed and renewed its commitment to sustainable development in the document *Alberta's Commitment to Sustainable Resource and Environmental Management*. This document outlines a shared vision, provides provincial direction and highlights the importance of effective and up-to-date decision-making processes and regulatory climate. Integrated Resource Management, or IRM, is the method by which this commitment will be achieved.

IRM is defined as an interdisciplinary and comprehensive approach to decision-making for managing natural resources. IRM integrates decisions, legislation, policies, programs and activities across resource sectors to gain the best overall long-term benefits for society and to minimize conflicts. This approach recognizes that the use of a resource for one purpose can affect the use of that resource for other purposes.

1.3 The Mandate of Alberta Environment

Alberta Environment is responsible for managing water resources. The mission and core businesses of Alberta Environment reflect the government's commitment to sustainable resource and environmental management. The government recognizes the environment as a complex, interconnected natural system. All parts of the natural system (biological, chemical and physical) are interconnected and must be considered together. Alberta Environment works cooperatively with other government departments to ensure that an integrated approach is used to manage resources and the environment.

Alberta Environment's core businesses are:

- ***Resource Management:*** The Ministry of Environment strives to ensure the sustainable use of Alberta's renewable resources through the development and implementation of legislation, policies, plans and programs; standard setting; compliance monitoring, ambient monitoring, renewable resource inventories, environmental impact assessments; and the issuance of approvals. The Ministry of Environment strives to ensure the environmentally responsible development of non-renewable natural resources in close collaboration with other ministries having a related mandate.
- ***Environmental Hazard Management:*** The Ministry of Environment reduces the risks of environmental hazards to people and property, and ensures the sustainability of our renewable natural resources through fire fighting, flood control, and problem wildlife control.

Alberta Environment initiatives that support these core businesses include environmental legislation outlined in the *Environmental Protection and Enhancement Act*, the *Water Act*, the Alberta Forest Conservation Strategy, and the Alberta Forest Legacy. Other initiatives that also support these core businesses include the Alberta Environmentally Sustainable Agriculture Agreement, the Fish Conservation Strategy for Alberta, the Northern Rivers Ecosystem Initiative and participation in the development of the Canadian Biodiversity Strategy.

1.4 Water Management: Vision and Principles

The vision and principles for sustainable water management adopted through consultation with the people of Alberta, reflect Albertans' values and beliefs and provide more detailed direction and guidance.

Vision

- *All Albertans are stewards of Alberta's water;*
- *Albertans act responsibly in managing and conserving water, to ensure the environmental, economic and social health of the province; and*
- *Albertans recognize the importance of living within the capacity of the natural environment as a means of ensuring the sustainability of water.*

Principles

- **Water must be managed sustainably.**
  - *water must be managed and conserved to meet current and evolving needs without compromising the ability of future generations to meet their own needs.*
- **Water is a vital component of the environment.**
  - *water is recognized as one of Alberta's most important natural assets; and*
  - *the aquatic environment, including the diversity of aquatic life, must be protected.*

- **Water plays an essential role in a prosperous economy and balanced economic development.**
  - *water must be wisely allocated and efficiently used, and regulatory and administrative processes for managing water must be streamlined, user-friendly and fair.*
- **Water must be managed using an integrated approach with other natural resources.**
  - *the interdependence of water quality and water quantity is recognized;*
  - *the interdependence of natural resources is recognized; and*
  - *water management is based on a watershed approach.*
- **Water must be managed in consultation with the public.**
  - *the public must be involved in water management and decision making;*
  - *information sharing and open communication must be provided for; and*
  - *opportunities for public education must be supported.*
- **Water must be managed and conserved in a fair and efficient manner.**
  - *water rights which existed under the Water Resources Act must be recognized;*
  - *enforcement action when required must be applied firmly, fairly and consistently;*
  - *water management must respond to differing local and regional needs; and*
  - *the Government of Alberta must work cooperatively with governments of other jurisdictions.*

This information provides the foundation or sets the stage for discussing water management planning.

2.0 WATER MANAGEMENT PLANNING

Section 2 provides a description of the major components of water management planning. It describes how planning fits in the broader decision-making process and how plans are approved and implemented.

2.1 Intent of the Framework for Water Management Planning

Managing water and protecting the aquatic environment are challenges for the government and all Albertans. There are geographic challenges based on greater quantities of water are in the northern half of the province than in the southern half. Based on the distribution of our province's population, there is a greater demand in southern Alberta. As the population of Alberta increases, so will the pressures on the water resource. Not only will consumptive uses increase, but there will be increasing demand on non-consumptive uses such as fishing, boating and sightseeing. As well, the aquatic environment - rivers, lakes and wetlands - provides homes for many of the province's plants and animals, and needs to be preserved.

A greater demand for water means that the resource must be managed more intensively. Water management planning guides decision-makers and stakeholders, so that the numerous demands on aquatic resources can be balanced. This planning will help ensure a clean and abundant water supply for all Albertans and will protect the aquatic environment, now and in the future.

The framework is intended to provide general guidance by outlining the components and steps used in water management planning.

The Framework for Water Management Planning sets the stage for water management planning in the province. Water management planning has been practiced in the province for many years. The components of the framework reflect successes from past experience and new requirements based on our increased understanding of the complexity of the environment and the challenges of the future.

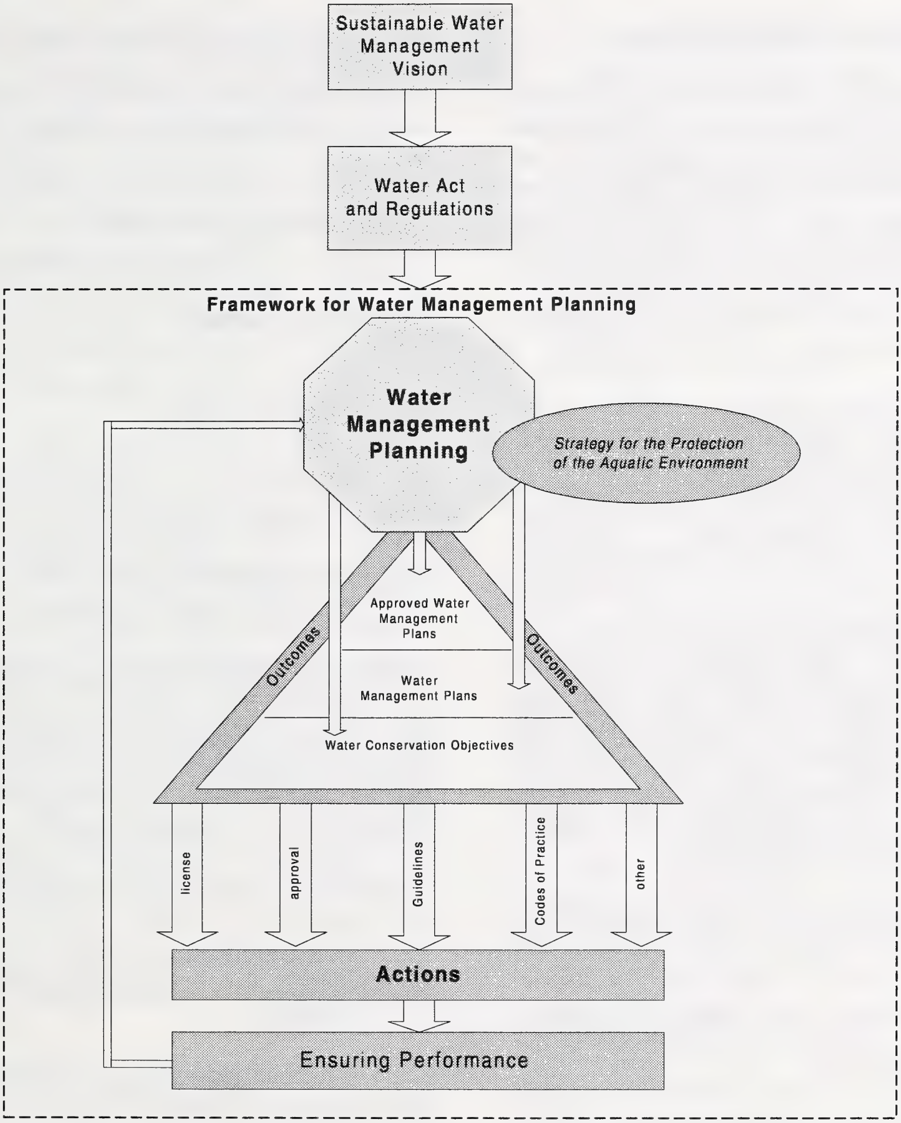
A key component of the framework is the Strategy for the Protection of the Aquatic Environment. The strategy addresses the province's commitment to protect the aquatic environment. In many cases the protection of the aquatic environment will drive the water management planning process.

This document is not a detailed user manual on how to prepare water management plans. While the major components of all plans must be similar, detailed processes for preparation of plans will vary.

2.2 Components of Water Management Planning

2.2.1 Vision and Principles

The vision and principles that were accepted by the government after extensive public consultation will guide sustainable management of water in Alberta. All water management planning activities must be consistent with this vision and principles. The vision and principles are provided in Section 1.4 of this document.


Sustainable Water Management Vision
Water Act and Regulations
Framework for Water Management Planning
Water Management Planning
Strategy for the Protection of the Aquatic Environment
Approved Water Management Plans
Water Management Plans
Water Conservation Objectives
Outcomes
Outcomes
license
approval
Guidelines
Codes of Practice
other
Actions
Ensuring Performance

2.2.2 Fundamentals for Planning

In addition to the principles for water management, there are a number of principles that apply specifically to the planning process. Adherence to these principles will ensure that planning activities are:

- comprehensive;
- coordinated and integrated;
- proactive and predictive;
- responsive and flexible;
- knowledge-based;
- consultative;
- procedurally fair;
- timely and results-oriented;
- accountable; and
- clear and understandable.

2.2.3 Responsibility for Planning

The government will continue to do water management planning and to play a lead role. Non-government organizations or stakeholder groups may also develop water management plans. For example, a lake management society or a forestry company could initiate a water management plan. This plan would be created in partnership with government.

The government, through its commitment to sustainable resource and environmental management, has made it clear that responsibility for water management is shared by all Albertans. Municipal governments, industry, and members of the general public will need to play a role in water management planning activities. The government will support and facilitate public involvement and ensure that the level of involvement will be appropriate to the type of planning activity conducted. Through Community Level Service, there will be the opportunity for public involvement at the local level.

The government will retain responsibility for the endorsement or approval of plans and decisions under the *Water Act*. The process for endorsement and approval of plans is outlined in section 2.2.7, 'Outcomes of the Planning Process'.

2.2.4. Planning Areas

Geographic limits for water management planning areas are based on watershed boundaries. A watershed is an area of land from which all water flows to a common location. Watershed shapes and sizes vary. A watershed may feed to a lake, wetland, creek or river. The largest watershed level is a major river basin, of which Alberta has seven. Each major river basin is made up of smaller watersheds that contribute to it. Planning areas may not always correspond to watershed boundaries. Planning areas may need to be adjusted to include the management of groundwater aquifers or to reflect federal, provincial or local boundaries. However, water management planning is most effective when it is based on watershed boundaries.

2.2.5 Scope of Planning

Water management in Alberta includes a broad range of planning activities carried out at different levels. Planning may involve a very small geographic area, driven by a single issue. For example, a group of local stakeholders may work with government to address a flooding problem in their area. Planning can also be done for a very large area where a comprehensive and integrated approach is needed to address a number of issues. An example of this would be development of a river basin plan for a large river basin, which incorporates the water resource needs of a number of stakeholders.

2.2.6 Criteria for Establishing Order of Planning

Local or regional priorities for planning will be developed in consultation with the public. Provincial priorities for planning will consider regional and local input. The criteria for determining which planning initiatives are to be undertaken first include:

- Pressure on the Resource
    - What are the present and anticipated quantity demands?
    - Are there serious water quality problems?
    - Is there a threat to habitat or species?

- What is the extent of the pressure?
  - long term or short term;
  - temporary or permanent;
  - isolated or cumulative?

- Public Concern
  - Are there environmental, economic or social concerns?
  - Are there concerns on an international, national, provincial, regional or local scale?
  - What is the urgency?

- Relationship with other Resources and Initiatives
  - Are there other related resource issues or initiatives?
  - Are there any current or anticipated government commitments?

2.2.7 Outcomes of the Planning Process

The outcome of the planning process can take the form of a water management plan, a water conservation objective or it can provide other guidance for resource management decisions. Outcomes of planning must be consistent with the *Water Act* and other legislation, regulations and policies. Some outcomes may result in a requirement to amend existing legislation or policies.

- ***Water Management Plans***

Water management plans provide broad guidance for water management, set out specific directions regarding how water should be managed, or result in specific actions being taken. The scope of the water management plan is also broad enough that it can impact how business is done in other resource areas.

A water management plan should include the following information:

- a summary of the issues considered;
- a description of the planning area;
- a summary of the information assembled as part of the planning process;
- relationship to other planning initiatives;
- the options identified;
- recommendations on the options that should be followed and any other recommendations related to water management; and
- performance monitoring.

A water management plan may be created to establish direction for resource decisions. For example, a lake restoration plan may be created to address the issues of fisheries management and water allocation in that watershed.

The level of approval needed for a plan depends on the scope or scale of the issues addressed. The Director responsible for water management will endorse smaller scale plans, which focus on local issues. If the plan deals with several regions in the province, it may be appropriate to have the plan approved by Cabinet. These plans are referred to as *approved water management plans*. The approval process is outlined in the *Water Act*.

Cabinet's approval of a plan may be required based on the scale of issues being addressed. Cabinet's approval of a plan is required if the plan makes recommendations regarding:

- the number of households permitted on a parcel of land;
- the ability to transfer water under a licence;
- the ability to withhold water under section 83 of the Act; and
- the creation of a new policy.

● ***Water Conservation Objectives***

A water conservation objective is a numerical objective that could be set either as part of a water management plan or independently to address a specific issue. As outlined in the *Water Act*, they will also be used to ensure the appropriate quality and quantity of water for tourism, recreation, transportation and waste assimilation. As well, water conservation objectives will serve as an important tool for the management of fish and wildlife. For example, a water conservation objective establishing a 50-metre wide buffer may be created to maintain the integrity of a riparian area along a specific river reach.

Water conservation objectives can be developed within a water management plan or independently. Cabinet will approve water conservation objectives developed within an approved water management plan. The Director responsible for water can approve water conservation objectives developed within smaller scale water management plans and those developed independently of a plan.

● ***Other Water Management Tools***

There are many other tools available to implement decisions related to water management. Tools available in the *Water Act* are: reservations of water; conditions of a licence; transfer of allocations of water; holdbacks on transfers; Crown licences; approvals for activities; guidelines; objectives; and codes of practice.

Some planning objectives can only be achieved by influencing activities outside of the scope of the *Water Act*. The environmental assessment process, as set out in the *Environmental Protection and Enhancement Act*, provides a means of reviewing development projects to assess their potential impact on the environment. Some projects are also subject to review by agencies such as the Energy and Utilities Board or the Natural Resources Conservation Board, to determine if the project is in the public interest.

Most forestry-related activities on public land are governed by a system of progressively more detailed plans including Forest Management Plans, General Development Plans, and Annual Operating Plans. Many of these plans are developed by industry and approved by government. These plans may address water management issues and may make the same recommendations as a water management plan, as long as it conforms to this framework.

2.2.8 Ensuring Performance

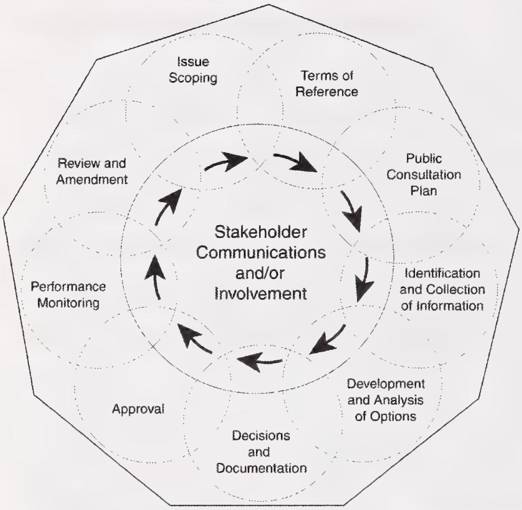
The overall success in achieving sustainable water management and decision making in Alberta will be measured as part of the Business Plan and Performance Measures of the Ministry of Environment. A number of approaches will be used to ensure that water management planning is effective and efficient.

Monitoring and assessment programs will be used to confirm that the desired results specified in the plan, objective or other management tool are achieved. If the results are not achieved, adjustments will be made as required. Cooperation is required from members of the public and the private sector to undertake monitoring, along with monitoring done by government.

Water management plans and water conservation objectives will be reviewed as necessary to ensure that they are relevant.

Any substantive changes to *approved water management plans* will require approval from Cabinet. Since the implementation of the water management plans and water conservation objectives rely on the tools in the *Water Act*, the Director is responsible for ensuring performance.

The *Framework for Water Management Planning* will be reviewed every five years to make sure it is up to date and continues to support sustainable water management.


Issue Scoping
Terms of Reference
Public Consultation Plan
Identification and Collection of Information
Development and Analysis of Options
Decisions and Documentation
Approval
Performance Monitoring
Review and Amendment
Stakeholder Communications and/or Involvement

Water Management Planning Process

3.0 DEVELOPMENT OF WATER MANAGEMENT PLANS AND WATER CONSERVATION OBJECTIVES

Section 3 outlines the major steps that are used to develop water management plans and water conservation objectives. The following steps will be used in the more formal and comprehensive planning process, and are followed, as appropriate, in informal planning activities as well.

3.1 Issue Scoping

The first step in the process is to identify the issues that need to be addressed and the type of product and planning actions that would best assist in the resolution of those issues.

3.2 Preparation of Terms of Reference

Terms of reference are prepared in consultation with all of those who will be involved. The terms of reference set out expectations and allow all involved to reach a common understanding. They include:

- goals and objectives;
- time and resources available and any related constraints;
- the planning area;
- the roles, responsibilities and accountability of those who will be involved; and
- how the results of the plan will be used.

An overall work plan is developed as part of the terms of reference to set out anticipated timelines, including important milestones and the anticipated total time that will be required. The schedule is reviewed and updated on an ongoing basis to ensure it remains realistic.

3.3 Preparation of a Public Consultation Plan

Public involvement is essential and overarches the planning process. A public consultation plan will ensure that communication is open and information is shared. The public consultation plan sets out how public participation fits into the planning process, which parts of the public are likely to be concerned, and how their comments can be most effectively solicited. The public consultation plan describes the sequence of the actual public participation activities that will take place. As a minimum a public consultation plan should include the following key areas:

- a description of any preliminary consultation;
- description of the probable major issues;
- key affected individuals and group;
- the decision-making process; and
- sequential plan of activities.

3.4 Identification and Collection of Information

Basic characteristics of the planning area must be documented. This includes compiling scientific information on water quantity available, the flow regime, the water quality, the physical habitat characteristics and the aquatic animals and plants present. It considers natural variability over space and time and describes existing conditions, including existing and proposed land uses.

Information is also compiled on all relevant policies, legislation, existing plans, prior commitments, and other relevant documents that may be required. Matters that are related to the management of other natural resources as well as water would be included.

Once all relevant information has been compiled, work plans are drawn up to identify potential information gaps. All information collected becomes part of the public record.

3.5 Development and Analysis of Options to Address Issues

All of the information that has been assembled is now carefully analyzed and assessed. Options are developed to address issues that were identified for the planning area. The consequences of the different options are identified. In addition, the planning process is used to identify the mechanisms and resources that are needed to implement each option.

3.6 Decisions/Documentation

The final document must have clearly stated decisions and direction for not only the manager of the resources but the general public. All documents must have a similar format and include all of the information required under the *Water Act.*

3.7 Approval

All plans must have some form of approval. The level of approval will vary depending on the scope and scale of the plan. One important consideration for the level of approval is the tools required to implement the plan. Specific tools such as transfers or holdbacks require that the plan be an approved water management plan as defined in the Act. The approval for this plan is provided by the Lieutenant Governor in Council (Cabinet).

3.8 Performance Monitoring

An important component of the planning process is to determine how well the water management plan is working. Monitoring programs are established to assess if the results met expectations. Concerns are recorded and used during the review process to improve the performance of the plan.

Performance monitoring is one of the most important aspects of planning. The following components are necessary to ensure credibility and flexibility:

- actual activities are compared to forecasted activities; and
- actual responses to management activities are compared to forecasted responses.

A performance monitoring process allows a plan to adapt to inevitable future changes in scientific understanding, policy or environmental changes.

3.9 Review and Amendment

If the expected results are not achieved, the plan is revisited and adjustments are made and implemented. Impacts arising from change are detected and negative impacts of the change are corrected. This could include something minor like administrative changes, or more significant, like the collection of additional information, a review of the analysis of the options, or a change in decisions.

4.0 STRATEGY FOR THE PROTECTION OF THE AQUATIC ENVIRONMENT

The purpose of this section is to define the aquatic environment through a discussion of its makeup or elements. The section outlines what is meant by protection and the various tools to achieve protection.

4.1 Introduction

4.1.1 Water and the *Water Act*

Albertans depend on the province's water resource for many different purposes. A clean, abundant supply of water is necessary for uses such as drinking, crop irrigation, industrial processes, and the generation of electricity. Water is also an important recreational and aesthetic resource, as the province's rivers, lakes, riparian areas and wetlands provide enjoyment for thousands of people each year. Water bodies and the lands that surround them also serve as important habitat for a great variety of animals and plants. In fact, aquatic ecosystems support the greatest biological diversity of all types of ecosystems.

Sidebar: Biological diversity, as defined in the *Water Act*, means the variability among living organisms and the ecological complexes of which they are a part, and includes diversity within and between species and ecosystems.

The *Water Act* widens the focus of water management to address multiple uses. The Act upholds existing commitments to water users, while including provisions that promote water conservation, protect water quality, and allow more flexible water management in fully allocated areas or in times of shortage. Fundamental to the *Water Act* is the recognition that the protection of the aquatic environment is an important element of sustainable water management. The Act requires that a strategy for the protection of the aquatic environment be developed as part of the provincial water management planning framework. This strategy is a reflection of the government's commitment to maintaining, restoring, and enhancing current conditions in the aquatic environment throughout the province.

4.1.2. The Aquatic Environment

The aquatic environment includes rivers, streams, creeks, riparian areas, lakes, and wetlands, each associated with a unique variety of plant and animal life. The aquatic environment is a complex system that is influenced by many factors such as climate, weather patterns, landscape form and features, geology and groundwater. Because of the complex interactions among these factors, the state of the aquatic environment throughout the province is naturally variable. Swift-moving, cold mountain streams support a different community of plants and animals than slower moving, warm, prairie rivers. Conditions in the large, deep lakes of northern Alberta will be different than those in the smaller, shallow lakes in the central and southern part of the province. Natural conditions also vary from season to season and from year to year.

The influence of human activity is reflected in the condition of some of the province's water bodies. Alberta's major river systems are impacted to varying degrees by municipal, industrial, and agricultural development. The quality of some of Alberta's lakes, particularly those in central and southern parts of the province, has declined due to human activity. Wetlands have been lost from many of the settled parts of the province.

The aquatic environment can be viewed in terms of four main inter-related elements, each of which is subject to human influence. These elements are:

- the amount of water available (*water quantity*);
- the chemical and physical characteristics of the water (*water quality*);
- the physical and biological structure of the water body and the land surrounding it (*habitat*); and
- the plants and animals living in or associated with water bodies (*aquatic species*).

We refer to the management of these elements throughout the document.

Water quantity is affected through withdrawals and return flows by agriculture, municipalities, and industry, and by changes in land use. Water quantity is also subject to control through the operation of diversions and reservoirs. Water quality is impacted by two major sources of inputs. It is impacted by point sources, *e.g.* direct "end of pipe" discharge from a municipality or an industrial plant. It is also impacted by non-point sources, *e.g.* via over-land runoff influenced by various land use practices or from the air in the form of acid rain. Habitat available for aquatic life can be altered physically through such activities as the building of dams, watercourse crossings, diversions, floodplain regeneration, erosion and the draining of wetlands. Aquatic species can also be affected directly through hunting, harvesting, fishing, or trapping.

Each of the elements listed above are ways that the aquatic environment can be altered and each also provides a focus for protection of the aquatic environment through management of the activities affecting it. Ultimately, by ensuring an adequate supply of water of suitable quality, and by conserving aquatic habitat and species, biodiversity and ecological integrity of the aquatic environment can be maintained.

Since the aquatic environment is such a complex and integrated system, water management planning involves other legislation in addition to the *Water Act*. The *Forests Act, Environmental Protection and Enhancement Act* (EPEA). and the *Public Lands Act* also have jurisdiction. For example, the aquatic environment includes the 'bed and banks' of water bodies.

Sidebar Definition: Ecological integrity – refers to the biological diversity, ecological processes and structure found in "natural state" ecosystems. Ecosystems exhibit integrity if, when subjected to disturbance, they sustain an organizing, self-correcting capacity to recover toward an end-state that is "normal and good" for that system.

4.2 Protection of the Aquatic Environment

The strategy for the protection of the aquatic environment reflects an integrated approach to water management in the province. Part of this approach is the recognition that the environment is a complex natural system, all parts of which are interconnected. Because of their interconnection, water, air, and land issues must be considered together. This principle is outlined in *Alberta's Commitment to Sustainable Resource and Environmental Management*.

4.2.1 Commitment

The Government of Alberta is committed to protecting the aquatic environment, now and in the future.

Protection will be achieved by maintaining, restoring or enhancing current conditions at different scales - from individual lakes, wetlands and river reaches to basins and sub basins. Which action to be taken will be determined by the current conditions and desired state of the water body as well as by a variety of constraints, including the existing commitments to water users. In some cases, protection will be achieved through the replacement or enhancement of habitat at another location.

Maintain, restore and enhance are defined as:

Maintain – take action to sustain present conditions

Maintenance of current conditions is a key part of the government's commitment to protection of the aquatic environment. It is easier to protect existing resources from degradation than to restore them after they have deteriorated. For example, to maintain current conditions in a river, municipalities and industries have limits for effluent releases in their approvals to operate. These limits help prevent exceedences of water quality guidelines in that river.

The *Water Act* helps protect the aquatic environment. The Act provides a Director with the ability to establish a moratorium on licence applications. The moratorium would allow for water requirements and management activities to be better planned and implemented, where required.

Restore – take action to return to more natural conditions

Where the aquatic environment is stressed beyond its natural range of variability, it may be desirable and feasible to improve conditions. A good example of a restoration program is the Alberta Riparian Habitat Management Program, known as "Cows and Fish," which guides and assists ranchers to modify livestock grazing practices in areas bordering streams and rivers. The program has restored these riparian areas, which has led to improved aquatic habitat, better water quality, and improved range conditions for the cattle producer.

Another tool in the *Water Act* involves the ability to holdback up to ten percent of the allocation of water that is being transferred under a licence. The holdback can be used to restore water levels or flows in areas of over allocation.

Enhance – take action to improve present conditions beyond what occurs naturally

In some cases, it may be appropriate to alter natural conditions to maximize the potential of the aquatic environment to support certain activities. Such improvements are usually based on human values or needs rather than environmental requirements. An example of an enhancement is the aeration of sport fishing lakes to prevent fish kills. Fish kills can occur due to low dissolved oxygen concentrations in lakes during winter. Aeration increases dissolved oxygen concentrations to enhance fish survival, thereby improving the sport fishing potential for the next year.

The *Water Act* enables the enhancement of the aquatic environment through a licence to implement a water conservation objective. The government can exercise this provision under the Act to ensure the integrity of the aquatic environment to a state beyond what exists naturally.

4.2.2 Setting Priorities for the Aquatic Environment

Setting priorities for protection requires an understanding of current conditions, trends and uses of the aquatic environment as well as possible future conditions and uses. The Government of Alberta recognizes the need to take precautions now to identify protection requirements in those basins which are not currently highly stressed. The government also recognizes the need to carry out protective actions in highly stressed basins to maintain and restore aquatic conditions. Highest priority will be given to those water bodies where present or future ecological integrity is at greatest risk or where the greatest benefits resulting from the actions will occur. Measures of ecological conditions such as water quality, number of species at risk, habitat quality, species distribution, and population trends can serve as indicators of ecological integrity. These indicators can be used as criteria for determining priorities for protection.

Setting priorities for protection cannot be done in isolation. Setting priorities may be part of the planning process outlined in section 2.2.6 Criteria for Establishing Order of Planning. The approach to protection – whether to maintain, restore or enhance conditions - depends on which of the four elements of the aquatic environment are under consideration.

4.3 Implementation

4.3.1 Improving Our Knowledge and Understanding

To identify priorities and goals for protection of the aquatic environment and to be effective at selecting appropriate protective measures, we need to know the status of the resource in terms of water quantity, quality, habitat, and species. We need to have a thorough understanding of how these elements interact, and what factors affect them. The consequences of managing the resource and the cumulative outcomes of individual and multiple decisions must also be understood. Those involved in managing the resource will:

- encourage testing innovative solutions to traditional problems;
- incorporate new information as it comes to light through research and monitoring efforts, or from experience elsewhere; and
- continually modify management based upon the results of experience.

Tools and activities that add to our understanding of the aquatic environment are listed in Table 1.

● *Data Collection*

Either solely or in partnership with industry, non-government organizations, stakeholders, other agencies or individuals, the government currently measures and assesses conditions in the aquatic environment through a variety of monitoring and inventory programs. These programs provide important baseline and long-term trend information. To assess the outcomes of decisions affecting the aquatic environment, monitoring programs should measure appropriate conditions and indicators specific to the planning area and its issues. Then, management approaches can be adjusted as necessary. Activities in which the government is currently involved include:

- measurement of river flows and lake water levels;
- water quality monitoring, including impact assessment;
- waterfowl and wetland surveys;
- fish and fish habitat inventories; and
- creel census and resource utilization surveys.

The need for monitoring and inventory programs in Alberta is increasing due to expansion of the oil and gas industry, forestry, agriculture, tourism and recreation industries, and because of the increasing human population. This represents a significant challenge as the province is large and monitoring is costly. This challenge will be met through continued collaboration and partnerships.

Future information collected about the aquatic environment needs to be organized and managed effectively. The government currently maintains extensive databases containing information regarding various aspects of the aquatic environment in Alberta. The government will ensure that:

- databases are as complete and up to date as possible through ongoing monitoring and assessment;
- databases are compatible with databases developed and maintained by other organizations and jurisdictions; and
- information is easily accessible.

● *Data Analysis*

The government is committed to the development and use of accurate, costeffective methods for analyzing and interpreting data, determining conditions required to protect the aquatic environment, and predicting the potential outcomes of different management options. Some examples of methods and tools used are:

- instream needs methodologies;
- water yield, water quality and flow modeling;
- use of water quality guidelines to assess current and predicted conditions;
- fish population and habitat assessment; and
- riparian habitat analysis.

These methods are being refined and upgraded on a continuous basis. The government uses opportunities to learn from other jurisdictions that have tackled similar issues.

● ***Research***

Gaining a better understanding of the complexity of the aquatic environment and the elements that affect it is fundamental for its effective protection. The government will continue to support research efforts focused on this area. As with monitoring and assessment, this will require collaboration and partnerships with universities, the private sector, and other levels of government. Research priorities include:

- increasing knowledge of aquatic ecosystem structure and function;
- understanding the processes which connect land, air, and water;
- development and refinement of appropriate criteria and indicators for measuring the ecological integrity of the aquatic environment;
- understanding natural disturbance patterns in the aquatic environment;
- assessment of cumulative effects of human activities on the aquatic environment; and
- developing models for riparian vegetation changes due to flow regulation.

4.3.2 Goals for Protection

The methods and predictive tools that contribute to our understanding of the aquatic environment will help us to define target conditions that must be met in order to achieve protection. Specific goals for protection can be set at different scales, from individual lakes or river reaches to the larger basin or province-wide level. These goals may be expressed as numerical limits (*e.g.* a water conservation objective which specifies the flow level required to protect fish habitat in a particular stream). Goals may be stated more broadly in terms of policy (e.g. the Wetland Management in the Settled Area of Alberta Interim Policy, which commits the government to sustaining "the social, economic, and environmental benefits that functioning wetlands provide.") Once established, these goals will be useful in choosing the appropriate water management tool for implementation. Different types of protection goals for the aquatic environment are listed in Table 1.

4.3.3. Achieving Protection

As described in previous sections, the four main elements of the aquatic environment are affected by a number of human activities. For each of these four elements—water quantity, water quality, habitat and species—there are different approaches that can be followed to achieve protection.
These approaches include:

- education and voluntary action;

- development of collaborative processes and partnerships;
- regulation and management of human activities and uses;
- physical works to maintain, restore or enhance the aquatic environment; and
- compliance monitoring and enforcement.

There are also a set of regulatory tools and programs that correspond to the four elements of the aquatic environment. These tools and programs are described below and listed in Table 1.

● *Water Quantity*

Water withdrawals, for uses such as irrigation, drinking water and industrial supply, may reduce flows in rivers and water levels in lakes and wetlands to a point where fish and other aquatic organisms are adversely affected. Changing land uses also affect water quantity. Needs for aquatic protection must be considered in terms of the demands for consumptive use. Ensuring adequate quantities of water for the protection of the aquatic environment is a major component of the strategy. Water quantity requirements for the protection of the aquatic environment will be incorporated in decision making and planning initiatives under the *Water Act*, including approvals and licences, water conservation objectives and water management plans. For example, a license may be issued with a condition stipulating that water cannot be withdrawn if the river flow is below a specified rate.

● *Water Quality*

Considering water quality requirements is crucial in the implementation of strategies for the protection of the aquatic environment. Water quality is influenced by water quantity. It can also be altered via point source or non-point source inputs.

- point sources

Point sources can be controlled directly. Approvals to discharge effluent into water bodies are issued under the *Environmental Protection and Enhancement Act* (EPEA). Limiting discharges to achieve water quality objectives for the protection of the aquatic environment is accomplished through those EPEA approvals.

There are a number of partnerships between industry and government to reduce industrial pollution below current regulatory limits. An example is Accelerated Reduction/-Elimination of Toxins (ARET), a voluntary, non-regulatory program that aims to virtually eliminate the emission of 117 persistent toxic substances. Partners include federal and provincial governments and major pulp and paper, chemical, steel, mining and petroleum companies across the country.

- non-point sources

Entry of substances to water bodies via diffused, non-point sources can be controlled by managing the land uses that are their source. Management of public lands is regulated by the *Public Lands Act*, under which public resource dispositions and conditions on dispositions can be issued. The *Water Act* can also direct how land use activities are carried out. The *Forests Act* aids in the management of non-point source impacts from forestry practices through the approval of plans to carry out activities *e.g.*, detailed Forest Management Plans, Annual Operating Plans and reclamation plans. The development of regulations, Codes of Practice (e.g. Code of Practice for Responsible Livestock Development and Manure Management) ground rules etc., help to minimize the effect that land-use activities can have on water quality. Direct regulation of substances entering the aquatic environment via non-point sources, such as pesticides, may be issued under EPEA.

● *Habitat*

Industrial, agricultural, and urban development may alter stream or lake habitat and riparian vegetation. Habitat can be maintained by mitigating the effect of potentially disruptive land uses by using many of the methods discussed above in *'Water Quality Non-point sources'*. In some cases where fish habitat loss is unavoidable, the "no net loss" working guideline, as described in the *Fish Conservation Strategy for Alberta*, will be followed to ensure habitat replacement or enhancement at another location.

As well, the federal *Fisheries Act*, which takes precedence over provincial legislation, prohibits the harmful alteration, disruption or destruction of fish habitat, unless allowed under a *Fisheries Act* authorization. Conditions placed on authorizations allowing the harmful alteration, disruption or destruction of fish habitat are intended to compensate for any habitat loss resulting from an activity and meet, at a minimum, the Department of Fisheries and Oceans' "no net loss" guiding principle. Currently the province and the federal government are engaged in discussions that may lead to the delegation of the fish habitat provisions under the *Fisheries Act* to the province. Until delegation of the habitat provisions to the province occurs, proponents of activities that could result in the harmful alteration, disruption or destruction of fish habitat must contact the Department of Fisheries and Oceans to obtain necessary approvals.

Habitat enhancement to increase production of fish or wildlife may be desirable in some areas. Many habitat enhancement activities are funded and implemented by conservation organizations such as the Alberta Conservation Association and Ducks Unlimited.

● *Aquatic Species*

Management of water quantity, quality, and habitat will help to protect aquatic species. Other regulatory tools apply more directly to management of the sustainable use of aquatic populations.

Alberta Environment regulates domestic, recreational and commercial fishing using the Alberta Fishery Regulations under the federal Fisheries Act. The regulations specify licensing requirements and set species, catch, size and gear limits for recreational, commercial and subsistence fishing.

Industrial roads and seismic lines can increase accessibility to fish-bearing lakes and streams, increasing fishing pressure on fish stocks. Access management, implemented through land use policies and regulations, can help to control fishing pressure.

Some aquatic resources other than fish are also used consumptively. These include waterfowl, furbearers, and peat. Use of these public resources is governed by its own regulatory regime, each of which must consider effects on the aquatic environment.

Elements of the aquatic environment	Improving Knowledge and Understanding	Goals for Protection	Achieving Protection
Water quantity	• Lake level and flow monitoring • Natural yield and flow modeling • Instream Need (IN) methodologies • Watershed assessments	• Water management plans • Water conservation objectives (water level, flow) • Meeting IN flows • Percentage of basin cleared • Maintenance of water source • Criteria to monitor and limit road development	• Water Act (water licence, terms and conditions in water licence, reservation of water, holdback on transfer of allocation of water, Crown licence, approvals) • Water Management Plans • Forest management plans • Forest Act ground rules • Public Lands Act disposition conditions
Water quality	• Instream Need (IN) methodologies • Long-term monitoring • Environmental impact assessments • Watershed assessments • Water quality models • Compliance analysis • Biodiversity assessments	• Water conservation objectives (quality) • Canadian Water Quality Guidelines for the protection of aquatic life (CCME) • Alberta Ambient Surface Water Quality Interim Guidelines • Industrial Effluent Limits Policy • Habitat Quality Indices	• Water management plans • Water Act approvals • Environmental Protection and Enhancement Act approvals • Public Lands Act disposition conditions • Forest management plans • Forest Act ground rules • Fisheries Act (Canada) • Fish and wildlife habitat protection and development guidelines • Canadian Environmental Protection Act (CEPA) • Municipal Government Act • Codes of Practice
Aquatic Species	• Fish population surveys • Fisheries stock assessments • Biodiversity assessments • Species inventories • Creel census/Utilization surveys • Breeding bird counts • Traditional knowledge	• Fish Conservation Strategy (fish-use allocation goal, fish conservation goal) • Species management goals • Canadian Biodiversity Strategy	• Alberta Fishery Regulations • Wildlife Act • Water management plans • Fisheries management plans • Migratory Birds Convention Act
Habitat	• Instream Need (IN) methodologies • Fish habitat inventories • Criteria for habitat development/enhancement • Land use database integrated with GIS • Alberta Vegetation Survey • Traditional knowledge	• Water conservation objectives • Fisheries management plans • Fisheries Act (Canada) • Fish Conservation Strategy: fish habitat maintenance goal • Wetland Management in the Settled Area of Alberta Interim Policy • Beyond Prairie Potholes – A Draft Policy for Managing Alberta's Peatlands and Non-settled Area Wetlands • "no net loss" working guideline • Percentage of basin with vegetation removed • Extent of road development	• Water management plans • Fish and wildlife development programs • Fish and wildlife habitat protection and development guidelines • Fisheries Act (Canada) • Forest management plans • Forest Act ground rules • Codes of Practice • Requirement for compensatory habitat development under approvals/dispositions • Public Lands Act • Migratory Birds Convention Act • Land use monitoring • Referrals • Education

Table 1- Understanding and Protecting the Aquatic Environment

SUMMARY

The draft Framework for Water Management Planning outlines the basic elements of the comprehensive planning process. It presents a number of opportunities for the public to become more involved.

This document is organized into four major sections. Section 1 provides background information that sets the context for the development of the Framework for Water Management Planning. A description of the main components of water management planning is provided in the second section. The document describes how planning fits in the broader decision-making process and how plans are approved and implemented. The third section outlines the major steps used to develop water management plans and water conservation objectives. The final section contains information regarding the protection of the aquatic environment. The Framework also defines what protection means and the various tools to achieve it.

Your input is important and necessary to create an effective framework that will be used for years to come by all Albertans involved in water management planning.

Providing Your Comments on the Draft

The government made a commitment in the *Water Act* to include public consultation in the development of the Framework for Water Management Planning. Your feedback on this draft Framework is very important. All comments will be carefully considered. The following is an outline of the process that will be followed with approximate timelines.

● ***Spring/Summer 1999***

- Distribution of the Framework for Water Management Planning discussion draft, including a Strategy for Protection of the Aquatic Environment.
- Review of the discussion draft by stakeholders and interested members of the public
- **Deadline for submissions August 27, 1999.**

● **Summer/*Fall 1999***

- Compilation and analysis of all public comments
- Preparation of a revised Framework for Water Management Planning based on public comments

● ***Fall/Winter 1999***

- Government review and approval of the Framework for Water Management Planning
- Release of the Framework for Water Management Planning, including a Strategy for Protection of the Aquatic Environment to the public

Suggestions for Your Submission

The government is interested in your comments on the Framework, including the Strategy for Protection of the Aquatic Environment. To assist you, the sections have been numbered. To help us with the recording of your submission, we request that you clearly identify the section you are addressing.

On your submission, please include your name, your address, your daytime telephone number, email address and, if appropriate, your organization. When listing your organization, please state whether the submission represents your organization's comments or your own.

Please send your comments to:

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The Public Record

This review is a public process. All submissions made are public records that are accessible by the public. They will be made available for viewing on request in the library of Alberta Environment.

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